

CVTPC ASCII Import MicroStation V8 Utility

User's Manual

Version 4.5

Updated: March 2003

CVTPC Version 4.1 - Attribute/Model Setup

Input Files

Ascii File: C:\Beacon\REVDGN\csessions\lev49.xyz
Cell Library: C:\Beacon\REVDGN\MhooonBend\civsur.cel
Attr File: C:\Beacon\REVDGN\MhooonBend\cvtpctest.att
Model File: C:\Beacon\REVDGN\MhooonBend\cvtpctest.mod

Attribute Setup

	Level	Color	Weight	L Style
Point	58	60	5	1
Line	0	59	2	Angle
Elev	58	168	1	Scale
Pt Name	0	2	1	45.00
Cell	0	97	2	90.00
Pt Code	0	48	2	60.00
Label	0	0	0	0.00
Op Note	0	0	0	0.00

Optional Note:
Point Code:
Cell Name: BM

Save

Attr Num: 1 Pt. Code Search: +
Search Att: 1 thru 300 -

☒ Preview Imported Elements
(Do not save to dgn file, does not apply to cells)

Return Start

CVTPC Version 4.1 - U.S. Army Topographic Engineering Center

File Utils

ASCII File: C:\Beacon\REVDGN\csessions\lev49.xyz
Cell Library: C:\Beacon\REVDGN\MhooonBend\civsur.cel
Attribute File: C:\Beacon\REVDGN\MhooonBend\cvtpctest.att
Model File: C:\Beacon\REVDGN\MhooonBend\cvtpctest.mod

Exit OK

Pt Code: 0
Label: 0

Data: Spaces Columns
String: Line String
Dec. places in elev.: 2
Remove Neg Sign: ☐
Use Active Scale: ☐
Use Active Rotation: ☐

Save

Preview of imported elements:

110.00
109.00
107.00
108.00
108.00
108.00
109.00
108.00
108.00
111.00
115.00
121.00
122.00
126.00
132.00
138.00

109.00
109.00
109.00
107.00
107.00
108.00
109.00
108.00
108.00
108.00
109.00
109.00
110.00



1. Introduction and Background

The U.S. Army Corps of Engineers utilizes MicroStation Computer Aided Design & Drafting (CADD) graphics tools for developing and documenting plans and specifications, and for documenting as-built drawings of construction performed within each District and Division. MicroStation CADD is a standard means of communicating graphic information both within each District and between each District, other Districts, Divisions, and Contractors.

A significant productivity feature of MicroStation is the capability to develop and distribute customized applications based upon the MicroStation Development Language (MDL), a c-like programming language. Prior to MicroStation Version 8, these customized applications have not required any modifications due to changing versions of MicroStation. The last time any changes had to be made to MDL applications due to a version change was when MicroStation Version 5 was introduced. Since then these MDL applications have successfully run with MicroStation Version 5, MicroStation 95, MicroStation SE, and MicroStation J. In the latest version of MicroStation, Version 8, significant changes must be made to MDL applications in order for them to function in this newest version of MicroStation.

MicroStation Version 8 incorporates some very significant changes in MicroStation's capabilities and it fundamentally changes the structure and format of the design file. Some of these significant changes include the following:

- Incorporation of a 64 bit internal element coordinate position, effectively expanding the design cube by 2 million times. No more limitations on coordinate position for almost any degree of position accuracy.
- Unlimited Number of Levels, vs. 63 Levels previously.
- Much larger limit on Design file size (4 Gbytes), vs. 32 Mbytes previously.
- Unlimited Number of Reference Files
- Up to 5000 Vertices in a Line String, vs. 101 vertices previously.

All MDL applications must be recompiled to run in MicroStation Version 8. Almost all MDL applications will need to be modified to run with MicroStation V8. The amount of work required to adapt an application depends upon the technology that it uses, the degree to which it interacts with DGN file graphical or control elements, and the method that it uses to interact with such elements. At a minimum, all applications must be recompiled. In extreme cases, where elements are directly manipulated without the aid of MicroStation's API, substantial rework may be necessary. The Version 8 changes affecting USACE customized MDL application are:

- Version 8 eliminates direct access of the Terminal Control Block, which is where the MDL application obtained values for global origin, working units, active text size, active text font, and text justification.
- Version 8 completely changed how elements are organized in the design file and how file positions are used. This affects any functionality that requires searching the design file, such as functions which search for the maximum graphic group number.
- Version 8 stores all internal string (character) variables as Unicode strings, not ASCII characters. This affects many functions, such as accessing individual cells, which use string names.
- Cell Operations are different, cells must be converted to Version 8, and cell names are Unicode not ASCII strings. Cell Operations are needed for automatic placement of survey points.
- The Version 8 MDL compiler is different, and stricter than in previous versions of MicroStation, requiring additional code not previously required and in some cases resulting in previously functioning logic no longer functioning the same.

Although the Version 8 MDL compiler significantly impacts existing MDL applications, the benefits of upgrading to Version 8 are compelling. Particularly compelling is the elimination of the design file size limitation and continued compatibility with other Districts utilizing MicroStation Version 8.

In 1994, the Topographic Engineering Center developed an MDL application, CVTPC, which facilitates importing survey points into MicroStation design files. These survey points can be in a variety of ASCII input formats including comma delimited, space delimited, etc. The graphic elements, which are placed in the design file, can be text, points, lines, or cells. Preference files can be established for input symbology and level control. The CVTPC utility is presently used in a number of USACE districts. The scope of this development effort was to upgrade the existing CVTPC MDL application to work within MicroStation V8, to correct some errors in the existing program, and to incorporate additional functionality into the program. The additional features incorporated include the following:

- When placing linear features, the program shall use the point name to control the length of the line. As long as the point name remains the same, the points shall be placed as a continuing set of line segments or as a multipoint line or curve string. As soon as a different point name is encountered, the line string shall be terminated at the previous point.
- A preview capability that allows imported points to be “viewed” without actually saving them to the design file. This preview capability will allow settings for element color, size, rotation, etc to be viewed and adjusted, if necessary, prior to writing the graphic elements to the design file.

Beacon Resources was selected to perform this MDL conversion/modification work under Contract DACW42-03-P-0108. A point of contact at Beacon Resources for technical questions is Mr. Michael Grounds at (256) 771-0014. E-mail may be sent to mike@riversrus.com.

2. Program Description

The ASCII files to be converted into MicroStation Design Files can have their coordinates and point descriptors placed in any order, i.e. "Point Name-X-Y-Z-Point Code", "Y-X-Z-Point Code-Point Name", etc ... The ASCII data can be delimited by spaces or commas, or it can be designated by column position. For example, ASCII data files separated by spaces would be of the form:

```
1 32987.34 45890.01 123.44 MANHOLE
2 32877.43 45799.22 122.32 METER
3 32853.89 45771.09 128.55 SPOT
```

Data separated by commas would be of the form:

```
1,32987.34,45890.01,123.44,MANHOLE
2,32877.43,45799.22,122.32,METER
3,32853.89,45771.09,128.55,SPOT
```

Data separated by columns would be of the form:

```
1      32987.34      45890.01      123.44MANHOLE
2      32877.43      45799.22      122.32METER
3      32853.89      45771.09      128.55SPOT
```

where the Point name (number) is in column 0, the X coordinate in columns 5-12, the Y coordinate in columns 15-22, the Z coordinate in columns 25-30, and the Point Code in columns 31-37.

3. File Requirements

CVTPC requires the following files:

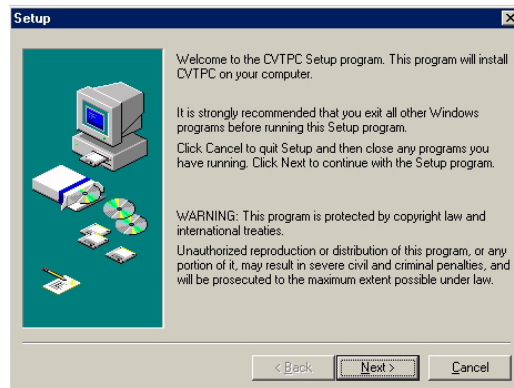
1. ASCII Input File - Examples noted in previous section.
2. Cell Library - Library of graphic symbols to be placed within the design file. A standard library Corps for surveying and mapping applications, CIVSUR.CEL, is recommended and is included on the program disk. **This file will be automatically installed to c:\Program Files\Bentley\Program\MicroStation\mdlapps when the CVTPC program is installed.**
3. Attribute File - File (created within CVTPC) that specifies the color, level, line codes, weights, scales, and angles for the elements to be entered in the design file.
4. Model File - File (created within CVTPC) that stores the field positions and format of the ASCII file.

4. Installing CVTPC on your Computer

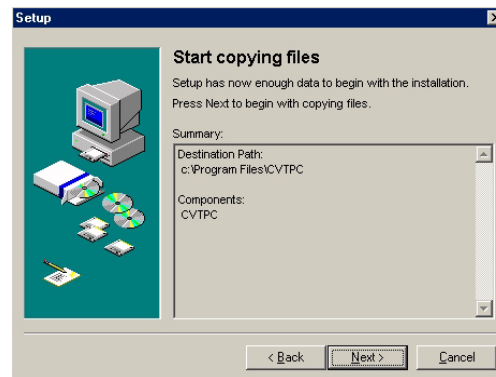
The CVTPC program is distributed in two ways, a CVTPCSetup.exe, which is a Windows-type installation program, or as individual files, which can be manually placed using Windows Explorer (i.e. File Manager). Both of these installation options are described below.

4.a. Using the CVTPCSetup.exe Installation Program

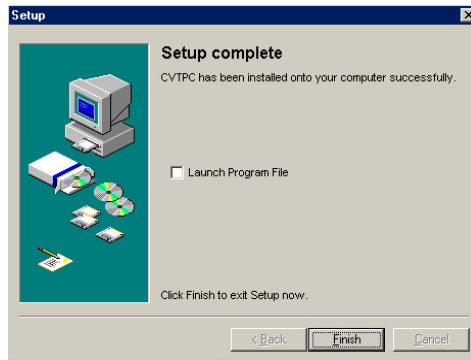
The easiest way to install CVTPC on your computer is to run CVTPCSetup.exe. This file can be run directly from the installation CD, can be downloaded from the Internet web site for CVTPC, or can be copied to any directory on your hard disk and then run. When the program is run, the following interface will be displayed:



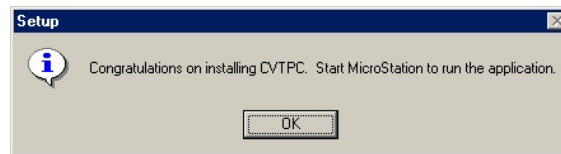
Press the Next button to continue. The following interface will then be shown.



Again, press the Next button to copy the files to the correct locations on the hard disk. Both the files cvtpc.ma and civsur.cel will be copied to the mdlapps directory under MicroStation, which is typically located in c:\Program Files\Bentley\Program\MicroStation\mdlapps. Press the Next button to continue with the installation process, the following interface will then be displayed.



Do not press the “Launch Program File” toggle. The CVTPC application is not a Windows application and will not run directly under Windows. The installed application is a MicroStation Version 8 MDL program and must be run from within MicroStation. The next step in the installation is to press the Finish button. The following interface form will be displayed if all files were copied successfully.



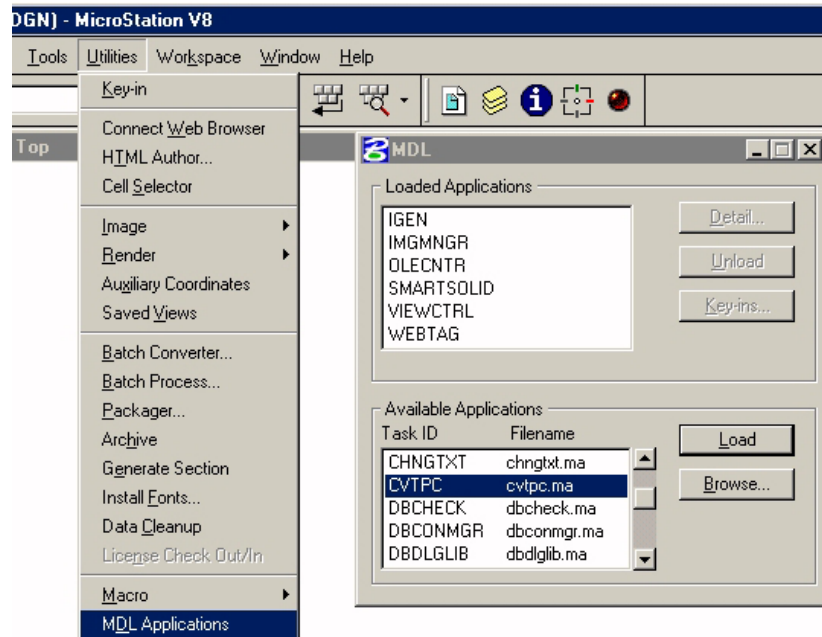
Press the OK button to exit the CVTPC installation program. Then, run MicroStation and proceed using the instructions provided in Section 5. Operating Instructions.

4.b. Individual File Installation

Using Windows Explorer, copy CVTPC.MA and CIVSUR.cel from the installation CD to the MDL applications directory. If MicroStation resides on your C: drive, this directory will be something similar to *C:\Program Files\Bentley\Program\MicroStation\mdlapps*.

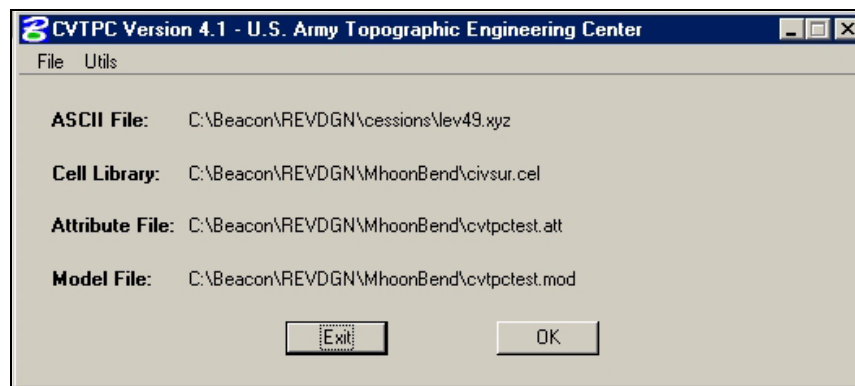
5. Operating Instructions

1. Start MicroStation.
2. Load CVTPC – As illustrated below, select the **Utilities** option from the MicroStation menu bar. Next, select the **MDL Applications** option. Select **CVTPC.MA** from the MDL Applications dialog box and then press the **LOAD** button.



Or, if you have loaded and docked the MicroStation key-in browser to function as a command window, then you can type "mdl load cvtpc" or "mdl l cvtpc" to start the application.

3. As illustrated below, the main CVTPC dialog box should appear. Select an input ASCII file and cell library. This can be accomplished by using the **File** pull-down menu in the upper left-hand corner of the main dialog box. Select or create new model and/or attribute files using the same menu.



4. Select the **OK** button.
5. The Attribute/Model Setup dialog box should appear, as illustrated below.

CVTPC Version 4.1 - Attribute/Model Setup

Input Files:
Ascii File: C:\Beacon\REV DGN\csessions\lev49.xyz
Cell Library: C:\Beacon\REV DGN\MhoonBend\civsur.cel
Attr File: C:\Beacon\REV DGN\MhoonBend\cvtpctest.att
Model File: C:\Beacon\REV DGN\MhoonBend\cvtpctest.mod

Attribute Setup

	Level	Color	Weight	L Style	Angle	Scale
Point	58	36	5	1		
Line	0	59	2			
Elev	58	22	1		90.00	1.000
Pt Name	0	2	1		45.00	1.000
Cell	0	97	2		90.00	1.000
Pt Code	0	48	2		60.00	0.500
Label	0	0	0		0.00	1.000
Op Note	0	0	0		0.00	1.000

Optional Note:

Point Code:

Cell Name:

Save

Model Setup

Field Position

Northing:
Easting:
Elevation:
Pt Name:
Pt Code:
Label:

Data:
String:

Dec. places in elev.:
Remove Neg Sign: ☐
Use Active Scale: ☐
Use Active Rotation: ☐

Save

Attr Num: Pt. Code Search:
Search Attr: thru

☐ Preview Imported Elements
(Do not save to dgn file, does not apply to cells)

6. First build the Model File by going to the **Model Setup** group box.

- a) Select the proper data type format for your ASCII file by using the **Data type** option button.
- b) Enter the **Field Positions** of the data. If a listed item is not used, i.e. no labels are to be placed, enter a zero in the option. If the ASCII File is separated by columns and an item is not used, enter a **999** in both the start and stop positions.
- c) Select the **String type**, **Dec. places in elev.**, and **Remove Neg Sign** options to meet your particular needs. The **String type** option is only used when placing lines within the design file.
- d) Save the model file by pressing the **Save** button in the **Model Setup** groupbox.

7. Build the Attribute File by going to the **Attribute Setup** group box.

- a) Enter the attribute you would like to edit in the **Attr Num** box.
- b) Enter the levels, colors, weights, scales, and angles for the various options. To turn an option off, enter **0** for the level.
- c) To save the Attribute File, select the **Save** button from the **Attribute Setup** groupbox.
- d) Existing attributes may be referenced by pressing the "Pt. Code Search" button. This will list the existing point codes in alphabetical order and will allow the user to move from one attribute to another.

e) An ASCII file with all of the attribute information can be generated by selecting "ASCII File Dump" from the **Utils pull-down** menu in the main dialog box.

8. Set the "Preview Imported Elements" toggle depending upon whether you would like to preview the elements (toggle set) or add them to the design file as permanent graphic elements (toggle clear).

9. Select the **Start** button to begin the program. The number of points processed will appear in the MicroStation readout window at the bottom of the screen. Any errors will also appear.

10. When all the points are processed, the **CVTPC Completed** window will appear. The number of points as well as the number of Nocon points (**No Convert**) will be displayed in the box. Any points that are not processed will be placed into a ASCII text file called **Nocon**. This file can be viewed by pressing the **View Nocon** button on the **CVTPC Completed** window or by selecting **View Nocon File** from the **Utils** pull-down menu in the main dialog box. This file can also be viewed with any ASCII text editor.

11. The **Return** button will close the Attribute/Model Setup dialog box and return you to the main CVTPC dialog box.

11. Select the **Exit** button to quit CVTPC.

6. Field Descriptions

Model Setup

Northing - The position of the northing (Y coordinate) in the ASCII file.

Easting - The position of the easting (X coordinate) in the ASCII file.

Elevation - The position of the elevation (Z coordinate) in the ASCII file.

Pt Name - The position of the point name in the ASCII file. Usually a name or number.

Pt Code - The position of the point code in the ASCII file.

Label - The position of the label or description in the ASCII file.

Data Type - The type of delimiter used by the ASCII file. Must be either spaces, commas, or columns.

String Type - The type of line to be used when drawing lines with CVTPC. Must be either line string (connect the dots) or curve string.

Dec. places in elev. - The number of places after the decimal point to be printed in the elevation.

Remove Neg. Sign - When on, this toggle button will remove the "-" from all negative elevations and place a "+" next to all the positive elevations.

Attribute Setup

Level - The level on which you would want the selected graphics to be placed. Valid entries are 1-63.

Color - The color you would want for the chosen graphics. Valid entries are 0-255.

Weight - The weight you would want for the chosen graphics. Valid entries are 0-15.

L Style - The line style (or code) to be used when drawing line strings or curve strings. Valid entries are 0-7.

Angle - The angle at which you would place the graphics. Valid entries are 0.0 - 360.0.

Scale - The scale at which you would place the graphics.

Point - When on, this option will place a point at the positions read from the ASCII file.

Line - When on, this option will connect the points with a line or curve string.

Elev - When on, this option will place the elevations in the design file.

Pt Name - When on, this option will place the point names in the design file.

Cell - When on, this option will place the cells in the design file.

Label - When on, this option will place the labels in the design file.

Pt Code - When on, this option will place the point codes in the design file.

Op Note - When on, this option will place a note in the design file.

Optional Note - This field is where the user would type in the note that is to be displayed in the design file.

Point Code - This field is where the user would enter a point code from the ASCII file to be matched with the current attribute.

Cell Name - This field is where the cell name from the cell library is to be entered. Capital letters must be used.

Attr Num - The attribute that is currently being edited.

Search Att # thru # - The attributes to be searched once the conversion has begun. This option will allow the user to greatly increase the speed of the program if the user knows which attributes are to be used during conversion.